

REMARKS

This is responsive to the Office Action dated February 26, 2004 in which the Examiner rejects all the claims as being obvious over combinations of Bhalla et al (US Patent No. 6,301,402), Davis et al (US Patent No. 6,215,565) and Czerwiec (US Patent No. 5,301,050) under 35USC §103(a). Applicants have amended independent claims 25 and 30 to better define the present invention with clearer language, and respectfully traverse the rejections based on the amended claims and the following detailed explanation.

First of all, Applicants believe a brief explanation of the present invention is helpful in understanding the patentably distinguishing features of the present invention as claimed over the cited prior art. The present invention teaches a novel maintenance system and method applicable at an optical switch fabric. In particular, in the real-time maintenance mode as taught by the present invention, an optical test signal is multiplexed with an optical traffic signal and transmitted through the optical switch fabric. After the transmission, the multiplexed optical signal is demultiplexed back into the optical test signal and the optical traffic signal, and the quality of both demultiplexed signals is measured, as expressly defined in independent claims 1, 15, 31 and 36. Thus, it can be easily determined whether the fault, if any, comes from the traffic signal or the optical switch fabric. The present invention also teaches a background maintenance mode in which an optical test signal is transmitted through the optical switch fabric and, after the transmission, optically measured as to its quality, as expressly defined in amended independent claims 25 and 30. Thus, the measurement is done in the optical domain, without a need to convert the optical test signal to the electrical domain.

Applicants respectfully disagree with the assertion of the Examiner that the present invention as claimed in independent claims 1, 15, 31 and 36 is obvious over combinations of Bhalla, Davis and Czerwiec. More specifically, none of the cited patents teaches or implies to demultiplex the signal

back into the optical test signal and the optical traffic signal, so the quality of both of them are measured to determine the possible fault source, as admitted by the Examiner in the Office Action (item 2). Moreover, Applicants respectfully disagree with the assertion of the Examiner that the demultiplexing step is a natural choice for a multiplexed signal, because a multiplexed signal does not always need to be demultiplexed, such as in Bhalla. In fact, in both Bhalla and Davis, the testing signal (or subcarrier signal) is measured electrically (i.e., in an electrical domain, but not in an optical domain). Therefore, it is not necessarily to multiplex the test signal with a traffic signal, and then to regain it through demultiplexing.

In particular, Bhalla teaches an arrangement for monitoring and controlling an optical switch. As explained above, the test signal is measured electrically in Bhalla, and therefore there is no need to separate the test signal from the customer signal by demultiplex the multiplexed signal. In fact, the multiplexed signal is tapped without demultiplexing (see col.3, lines 6-19). Davis does not teach the demultiplexing, either. As a matter of fact, in Davis, the signal generated by the subcarrier transmitter is a modulation superimposed onto the optical signal, but not multiplexed to the optical signal. The multiplexer 15 and demultiplexer 25 work for multiplexing and demultiplexing among plural optical signals but not for multiplexing the subcarrier modulation signal. Moreover, unlike the assertion of the Examiner, the subcarrier modulation is not measured by the OPM 37, but measured electrically by a subcarrier receiver 31 (see col. 3, lines 35-38). Therefore, Applicants respectfully submit that the combination of Bhalla and Davis cannot conclude the step of demultiplexing the test signal and the traffic signal, as taught in the present invention. Applicants have also reviewed Czerwiec, and cannot find such a teaching either. Therefore, Applicants believe that independent claims 1, 15, 31 and 36 are not obvious over the combinations of Bhalla, Davis and Czerwiec, and are therefore patentable under 35USC §103(a). At least for the same reasons, their dependent claims 2-14, 16-24, 32-35 and 37-42

are also patentable.

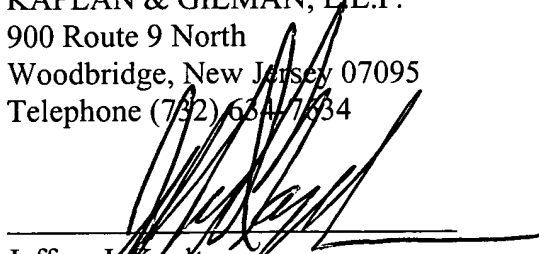
Moreover, the present invention defined in amended independent claims 25 and 30 teaches a background maintenance mode in which an optical test signal is used to measure selected channel of an optical switch fabric. In particular, the quality of the optical test signal is optically measured. In other words, the optical test signal is measured in an optical domain but not in an electrical domain. This is distinguishing from, and in fact contrary to, the teachings of Bhalla and Davis where the test signal (or subcarrier signal) is electrically measured. Czerwiec does not teach to optically measure an optical test signal either. Therefore, claims 25 and 30 are not obvious over the combinations of Bhalla, Dvais and Czerwiec under 35USC §103(a), and are thus believed patentable. At least for the same reasons, dependent claims 26-29 are also believed patentable as each of them includes all the limitations in independent claim 25.

Applicants therefore respectfully request reconsideration and allowance in view of the above remarks and amendments. The Examiner is authorized to deduct additional fees believed due from our Deposit Account No. 11-0223.

Respectfully submitted,

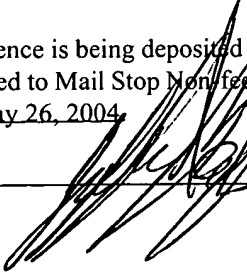
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal service as first class mail, in a postage prepaid envelope, addressed to Mail Stop Non-fee Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on May 26, 2004.

Dated May 26, 2004 Signed 


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